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REAL ESTATE ECONOMISTS, APPRAISERS AND COUNSELORS

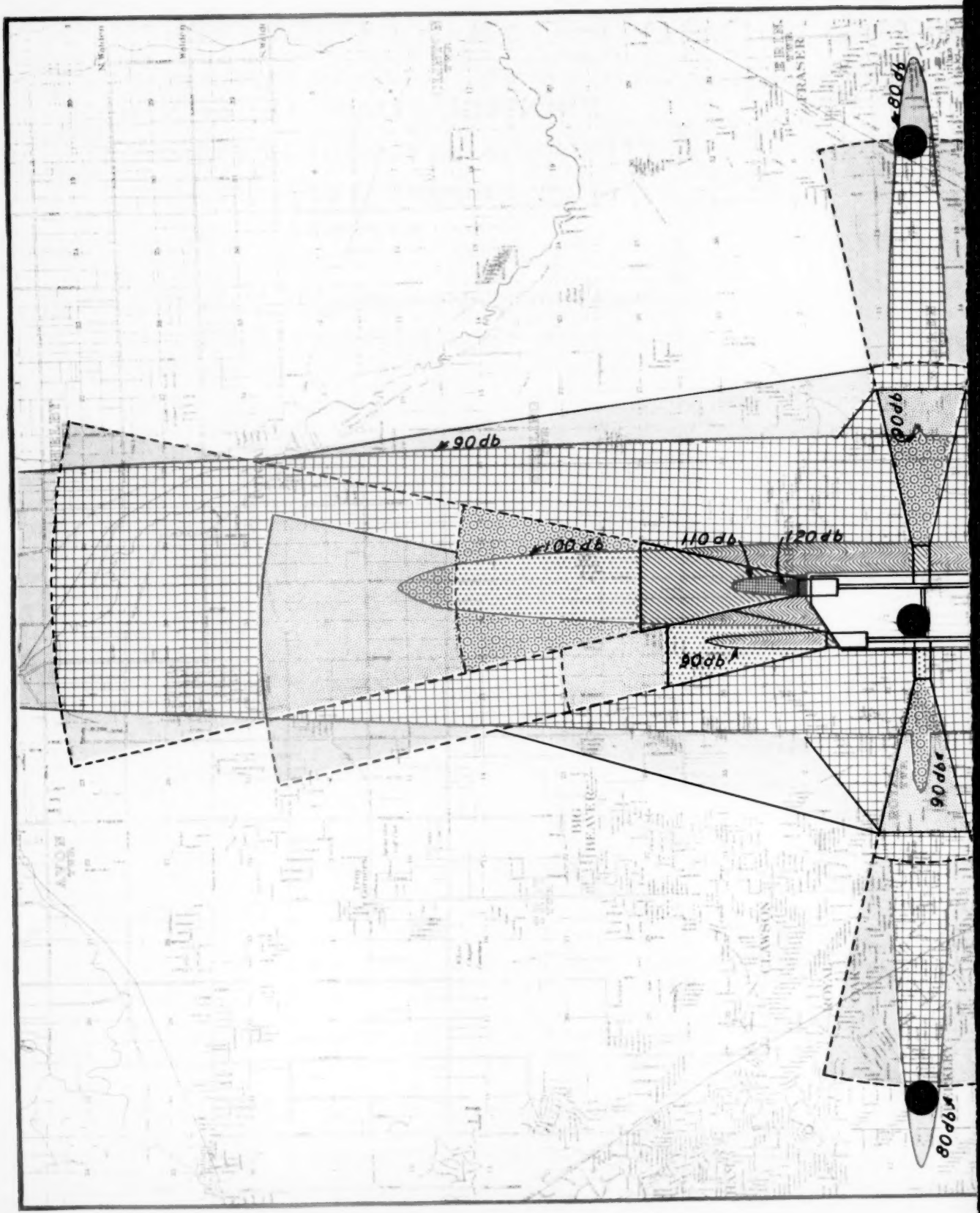
APPRAISAL OF DAMAGES TO REAL ESTATE CAUSED BY ITS PROXIMITY TO AN AIRPORT SERVING JET TRANSPORTS

EARLY this year we completed a study on the appraisal of damages that would probably result from the establishment of Detroit's Proposed Northeast Airport. The study was complicated by the probable use of the airport by jet transports with their deafening noise-making capabilities. At first the problem seemed merely a matter of a survey of similar areas. However, as the study of the problem progressed, we realized that no two areas are similar, and that comparisons were impossible. It was also found that no exploratory work had been done before as to specific damage patterns.

We concluded that the damages were primarily due to noise and vibration and danger or psychological danger. Damages due to the proximity of the airport and the question of trespass, the dust problem and night lighting were relatively minor.

Our first major problem was that of noise, its characteristics, its measurement, and how it varies with distance and the type of plane most likely to use this proposed airport. The intensity of sound is measured in decibels, while loudness is measured in phons or sones, which consider the frequency in cycles per second as well as the intensity. The intensity of sound varies, as does the intensity of light, inversely with the square of the distance from the source. It was not practical to measure the sound produced by jet transports from the numerous points under the path of flight, as there are no jet transports operating in this hemisphere, and the cost of preparing noise patterns on the ground by the use of sound meters was prohibitive. In order to construct our noise-patterns, research was required into the flight characteristics of the various types of planes that would probably use this airport. The average rates of climb, glide angles, and speeds during take-off were considered before arriving at the noise-patterns. The British Ministry of Civil Aviation and B. O. A. C., operators of the only jet transport service, cooperated in furnishing some of the basic data required by our study.

The center spread of this bulletin shows the probable damage zones that we concluded in this study. Damages range from a high of practically 80% on luxury-type residences in zone 1 to no damages for inexpensive homes in zone 7. Zone 1 is the small area at the extensions of the runways serving jet planes. In this area noise and vibrations make it impossible to sleep or converse during a jet


90db
90db
90db
100db
110db
120db
90db
90db
90db

PROBABLE DAMAGE ZONES

Likely to be Created by Operation of the Proposed Northeast Airport

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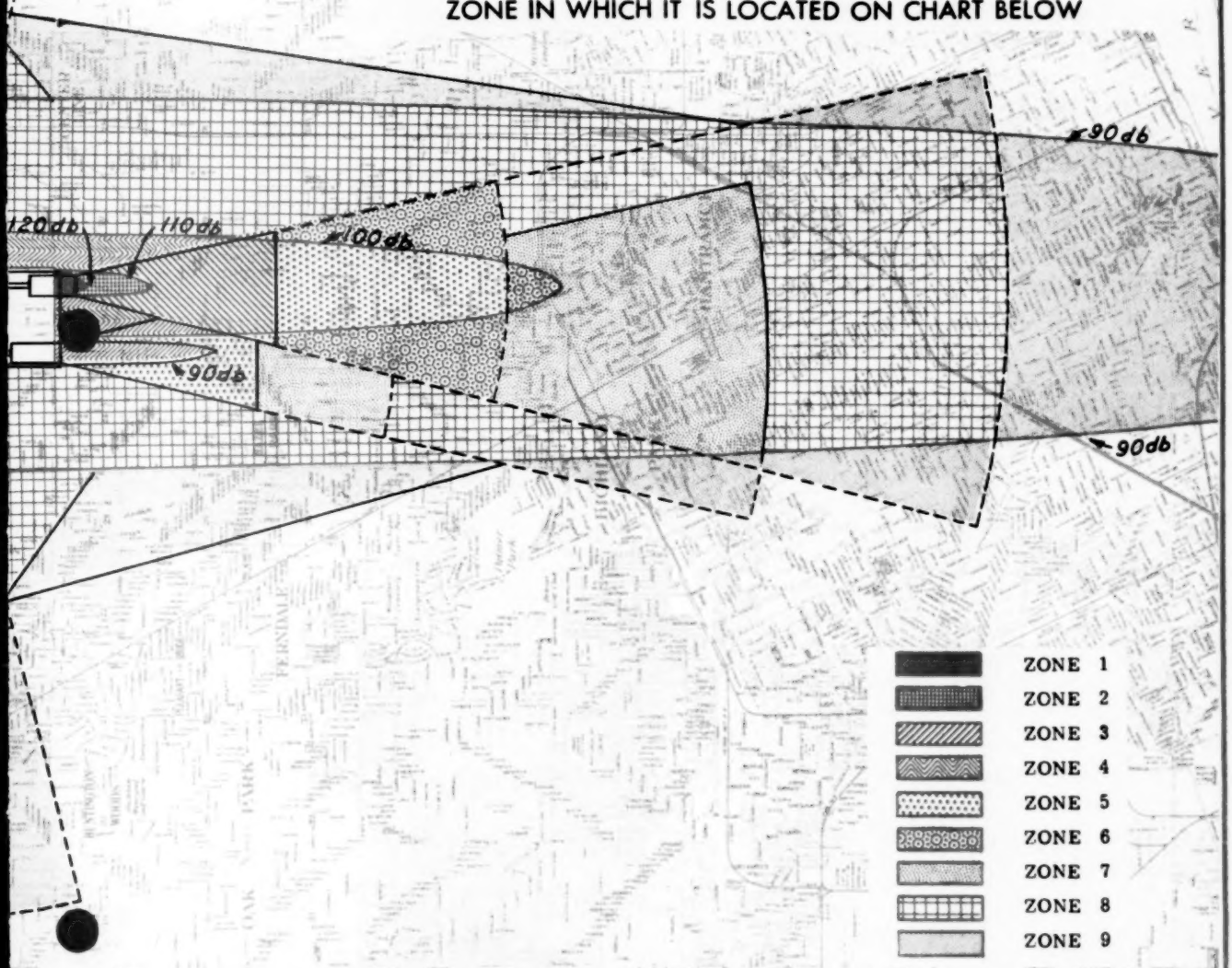
FOR EXTENT OF DAMAGES APPLY THE VALUE OF THE PROPERTY BEFORE THE ESTABLISHMENT OF AIRPORT & THE ZONE IN WHICH IT IS LOCATED ON CHART BELOW



transport operation, and the noise itself, which would likely be over 120 db (decibels), is physically damaging to the body. Furthermore, the frequency of disturbance would be greatest in zone 1, with the greatest danger from air - crashes. The 80% item of damage to an expensive luxury-type home includes the resulting loss in land value, offset by the probable salvage value of the structure. As the values of the homes decrease, the resulting damages lessen. For instance, in zone 9, in our opinion, the $50,000 home would have approximately a 10% damage, while a $20,000 home or one less expensive would not suffer.

Our conclusions as shown by these samples of the damages arrived at were based on the following individual studies: noise spectra of various types of aircraft; airplane crash locations in relation to runways; airplane landing and take-off speeds and angles; probable directions of flight based on study of wind - its direction and velocity; the effects of airplane crashes on the Newark-Elizabeth area; probable frequency of flights; legal cases relative to damages; CAA regulations; air rights and trespass; zoning; mortgage financing policies in the vicinity of an airport; noise insulation; future potentialities for the development of the area studied; minimization of aircraft noises; the damaging effects of noise; and study of miscellaneous publications on these and allied subjects.

The survey which was conducted in order to get the range of damages caused by the proximity of an airport to residential areas under existing conditions had to be adjusted in two ways. First, the question of appreciation had to be considered. Many airports have highly developed industrial areas in their vicinity. Consequently, there was additional demand for residential units, and no damages were incurred as long as the residences were not under a flight zone. Secondly, the aircraft accident rate had to be considered. The recent air disasters in the Newark-Elizabeth area may be considered as indicative of conditions that may develop in the vicinity of any major airport.

Our conclusions relative to the damage to residential building sites in developed subdivisions vary from 0 to 75%, depending on the zone and the type of subdivision. Undeveloped land, of course, would not suffer damages to as great an extent, although close-in and in the approach zones the land may be reduced to its value for agricultural purposes. Commercial and industrial properties must be individually studied in order to determine damages.

It must be remembered that the zones of damage as shown on the map in this report are computed for the combination of factors which were operating in this specific area. In any other area it is apparent that the influencing factors would vary both quantitatively and qualitatively, and would combine to form patterns which would differ from those shown here.

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